

Reading, Writing and Reading Comprehension: Coexistence between Printed and Digital Media

Genny A. C. Lopera

ABSTRACT

Culture is an extremely complex phenomenon that is linked not only to the communicative function but also to social practices. Reading and writing are constructs that have accompanied human beings since the appearance of the codex (ancient handwritten books), through the printing press. Nowadays, digital media, and even printed media, have great relevance, especially if we talk about informative vehicles possessors and transmitters of knowledge, which have an audience with significant reading and writing habits. The call is then to learn to make a joint and avant-garde use of print and digital media to strengthen the development of reading, writing, and reading comprehension from the school environment.

Keywords: digital text, literacy, printed text, reading, reading comprehension, student, writing.

Published Online: March 20, 2023

ISSN: 2736-4534

DOI: 10.24018/ejedu.2023.4.2.597

G. A. C. Lopera*

University of Antioquia, Colombia
(e-mail: genny.catanol@udea.edu.co)

*Corresponding Author

I. INTRODUCTION

The current era is characterized by the fact that many people use, in a wide range of their daily activities, technological tools, especially those related to telecommunications and information technology: social networks, e-mail, chat, SMS messages, blogs, videoconferencing and video games, among others. Reading and writing in the digital era are different from those of the past and even different from each other; however, they are still forms of expression, communication and understanding of the world.

A digital era such as the current one implies transformations in social, cultural, and economic relations, as well as changes in the communicative forms made possible by the development of technology and its deployment in the supports or instruments used. However, even in the midst of so many technological advances, print and digital coexist, both in developed countries and in emerging or developing countries like ours. It is easy to observe in others and to notice in one's own activity, how the screen coexists with the paper in daily tasks, and the keyboard coexists with the pencil; although the former (screen and keyboard) has modified the usual structure of the text, its production, and its reading with respect to the printed one.

The emergence of electronic text has given rise to a series of prejudices and concerns, generally unfounded and little explored. In all fields, especially in the academic world, we hear questions such as the following: Are we still reading and writing as usual? Is reading and writing being transformed in the digital era? Have new technologies changed the way we read and write? Are we facing new reading and writing practices for new times, or is it simply a

change of medium? Is it possible that reading and printed text will disappear due to the appearance of electronic text? Is the electronic text so favorable for the learning process that it is worth promoting its exclusive use, replacing the printed text? Is the printed text in disuse, in terms of its production and reading, thanks to the appearance of the electronic text and multimedia? Even in the midst of this panorama, is it possible to harmoniously use the printed and the digital with the purpose of strengthening the development of reading, writing and, with them, reading comprehension?

The purpose of this text is to present some arguments and proposals that, even if they do not answer all the questions raised, at least allow us to elucidate, in some way, the doubts they raise. Fundamentally, this article aims to answer the last of these questions in the affirmative, exposing, first, the way in which reading and writing coexist in print and digital; then, the preparation that the student needs to face these two formats; and, finally, how reading and writing approached together in print and digital media, contributes to the development of reading comprehension skills.

II. COEXISTENCE OF READING AND WRITING IN PRINTED TEXT AND DIGITAL TEXT

We are currently facing a duality of great apogee in the contemporary world, represented, on the one hand, by the cybernetic gurus and the technological generation, and on the other hand, by readers, publishers and librarians who are part of that technology of yesteryear, so dear, which is the book (object of cultural transmission par excellence), the same one that has coexisted with human beings since the introduction of the printing press in the middle of the 15th century, in Mainz.

Reading and writing are social constructions that are the product of culturally defined activities (Ferreiro, 2001); they change throughout history, human actions and even according to geography (Di Stefano & Pereira, 1997). The human being has been given the task of creating successive writing technologies, where its communicative potentialities have also been used in different ways and in different ways dynamic for each society, according to its needs, interests, and circumstances. According to the sociocultural context, reading and writing have adopted their own practices, in the manner of discursive genres with certain functions to be fulfilled, where reader and writer play certain roles, with pre-established linguistic uses and a pre-established rhetoric (Cassany, 2004).

Reading and writing are social practices, cognitively contextualized and above all interactive; and they are skills that are currently developed in both digital and printed formats (children, young people and adults today read and write in both formats). Consequently, it is not possible to speak of “reading” or “writing,” but of a diversity of “readings” and “writings,” that is, of reading and writing practices that do not depend (at least entirely) on the medium of the text, but rather, as Vaca and Hernández (2006) point out, on specific social activities and communicative situations in which they are immersed.

Reading and writing are essential for performance in school, at work, and in everyday life in the 21st century, so it is necessary for young people to acquire the literacy skills needed to succeed in an analog but also increasingly digital and information-based world. According to shared knowledge theory (Shanahan, 2016; Tierney & Pearson, 1983), reading and writing are not identical skills, but both draw on the same knowledge and cognitive systems; hence they can be addressed in tandem or in tandem. As Seymour Papert once said, *whenever one particle acts on another, there is an equal and opposite reaction on the first* (1981), which exemplifies very well the close relationship between reading and writing, and between print and digital.

In the words of Daniel Cassany (2004), reading is a dynamic act and there is no single way of assuming reading, perhaps neutral or abstract; rather, each discursive genre presents multiple and varied forms and even versatile ways of undertaking it, according to each discipline of knowledge and in correspondence with each sociocultural community. Thus, learning to read not only requires the development of certain cognitive processes, but also the acquisition of sociocultural knowledge of each specific reading and writing practice: how reader and writer use each type of text, how they appropriate those uses prefixed by tradition, and how they reach an agreement on the meaning according to their linguistic conventions and the currents of thought of each particular discipline, among other aspects.

On the other hand, writing is an activity that involves reflection and analysis; while the authors compose a text, they learn both about the subjects treated and about themselves (Cassany, 1997; cited by Henao *et al.*, 2006). As Octavio Henao *et al.* (2006) point out, the act of writing, of giving order to ideas in order to communicate them to others, not only evidences existing knowledge, but also activates, reinforces and even transforms it; it is an effective means to construct new meanings and to approach a subject or object

of knowledge more comprehensively. During the composition process, the understanding of that which is intended to be written or is being written is expanded, changed, and enriched.

Reading and writing are activities in which meaning is generated. Paraphrasing Rowsell and Walsh (2015), meaning is generated as one decodes and interacts with the text and links past experiences to new experiences or new knowledge. Reading has a purpose, such as enjoying a literary text or learning from an informative text. Writing also has a purpose, such as writing one’s own thoughts, communicating information, creating a story, or presenting one’s own ideas to another, be it a reader or an audience. In sum, “the construction of meaning happens whether we use traditional texts, on paper, or digital or multimodal, and the level of meaning varies according to our purpose and the textual genre” (Rowsell & Walsh, 2015, 146).

When the reader is confronted with the text and can experience emotions and even organic responses equal to those experienced in real situations, we can speak of a real reading. In this aspect, the reader’s personal knowledge and experiences (linguistic and from his own life) play a fundamental role in the reading process, since they allow him to make sense of the total text, as a unit of meaning, and not in a partialized way; and it is from there that meaning emerges. In short, meaning is related to comprehension, which is nothing more than the possibility of answering the questions that the reader raises when confronted with a text and expects to answer during reading (Smith, 1997; Eco, 1981; Rosenblatt 1985; cited by Morales and Espinoza, 2003).

Reading is not just flipping through a book and going through it linearly and sequentially, but understanding it, retaining it and making it dialogue with other readings, that is, reading is necessarily reading in depth and in context (Casati, 2015). As argued by Nicholas Carr (2011), reading is not an instinctive skill and neither is it engraved in the genes, but it is learned and the way in which it is developed through certain media or technologies (on paper and/or electronic support) helps to shape the neural circuits.

According to Teberosky and Tolchinsky (1995), writing is an intellectual activity that is carried out by means of a graphic, manual, printed (or electronic) artifact with the purpose of recording, communicating, counteracting or influencing the behavior of others, and that makes possible the production of ideas and their reproduction. Donald Murray (1980), on the other hand, argues that composition is a process in which writing finds its own meaning through the interaction of three stages: rehearsing, drafting, and revising; these sub-processes are not sequential, but occur simultaneously during the writing process.

Coinciding with Murray (1980), Frank Smith (1981a; 1981b) indicates that writing is a process of meaning production and that there are three episodes (sub-processes or stages) involved: prewriting (preparation or incubation period), writing, and rewriting (which includes revision and editing). These episodes are inseparable and are in constant interaction with each other during the whole process, although at some moments of composition more emphasis is placed on one than the other.

Taking into consideration these conceptualizations, and

Kilian's (2001) proposals on writing on the web and its parallel with pencil and paper, together with some pedagogical experiences (Espinoza & Morales, 2000 and 2002; Morales & Espinoza, 2002), it could be argued that a similar process is followed both when producing a printed text and an electronic text, since in both formats similar aspects are taken into account and subprocesses, stages or recursive episodes are experienced: preparation or planning, writing or textualization, revision, and proofreading or editing, until the expected publication is reached.

Reading and writing, although different from each other, are closely related and in the digital era, with respect to past eras, what changes is the support but not the essence of each one (Morales & Espinoza, 2003). Reading and writing continue to be forms of manifestation, interrelation, and perception of the world, even when the technological boom of the present century creates fast and even ephemeral forms of communication and this may lead to different relationships than those we have always known (Cordón & Jarvio, 2015).

Reading and writing are critical to students' success in and out of school. Because they draw on common sources of knowledge and cognitive processes, involve the creation of meaning, and can be used together to achieve important learning goals, it is often recommended that reading and writing be taught together (Graham *et al.*, 2017), and what better than to do so from print supports on par with digital ones.

The nature of the text will always be the same, whatever the support or container. Electronic text requires the reader to have the same prior knowledge that is needed to read a printed text (Morales & Espinoza, 2003). The reader, although using different formats or containers (CD, DVD or WWW), applies the same reading strategies proposed by Kenneth Goodman (1980a; 1980b) for printed text: Initiation, Sampling and Selection, Prediction, Inference, Confirmation or Rejection, Correction and Completion.

In this regard, Godard (2002) states that in the digital or electronic text the same comprehension factors are taken into account as in traditional or analogical reading: text coherence, previous knowledge, discursive schemes and cognitive skills of the reader. Therefore, it cannot be said that the reading process is different in one format or the other, society has simply evolved, and it is impossible for reading and writing, the main legacy of humanity, to be unaffected by this change. The pleasure of reading will always be the same, whether using sheets of paper or the latest generation of screens. In short, it is all in the text, not in its presentation.

As Morales and Espinoza (2003) note, the current educational system must train the citizen/user of the written language to be competent in reading and producing in both formats, since traditional and technological literacy are part of the individual's general culture. Both digital and the use of both print and digital media is necessary in contemporary society, since effective communication requires the use of both.

In view of the above, the benefits of using any format, whether printed or digital, cannot be denied. What is important is the promotion of reading, whether the texts are narrative (literary), expository (informative), argumentative

or descriptive; what prevails is the benefit of reading. Writing, on the other hand, should be promoted through pencil and paper as well as through word processors, Tablet PCs, or e-mails; after all, it is not the format that matters, but the ability of writers to produce coherent and cohesive texts (Morales & Espinoza, 2003).

III. THE STUDENT FACING THE NEW LITERACY

The concept of literacy was understood simply as knowing how to read and write. In many cases, the traditional school today continues to propose this same definition of literacy to students, while society, for some time now, has been demanding a different one. The truth is that schools in developing countries have not yet learned to teach literacy and must now face the challenge of seeing the Internet enter the classroom, although not so much by pedagogical decision.

Nowadays, social and labor requirements are much higher and more demanding, and although students who are now in the classroom are children and young people who were born with computers installed in society (although perhaps not in their homes or schools), they do not have an innate knowledge of how to properly manage with them, because being a digital native does not necessarily mean knowing how to understand in an electronic medium (Ferreiro, 2011; García, 2012). And as if this were not enough, students also present an abysmal difference with their teachers, who come from a non-digitized era but are immersed in it, whether they want to or not.

There is currently a high degree of illiteracy among teachers and their students, based on the inability, or refusal in some cases, to speak of "reading" and "writing" instead of "reading" and "writing," and to move from "the book" in the singular to "books" in the plural, not to mention computer networks and other similar inquiries (Ferreiro, 2001). It is necessary, in order to begin the great change that summons the school, to start by realizing that the verbs "to read" and "to write" no longer have an immutable definition, since they no longer designate homogeneous activities. Reading and writing are social constructions and each era and historical circumstance give new meanings to both skills.

The right to the highest quality literacy for new generations, regardless of their socio-cultural and economic condition, is relevant. Therefore, new educational policies are required to train children, young people and adults in reading and writing skills in printed and digital media, which should be projected in school training (initial and higher), and in teacher training (Ferreiro, 2011; García, 2012).

Approaching the printed text and the digital text at the same time makes it possible to face reading and writing processes in a different way than usual; however, summoning the student to work in both supports, by itself, will not simplify the cognitive difficulties of the literacy process, nor is it the method-technology opposition that will make it possible to overcome the misfortunes of illiteracy (Ferreiro, 2001). The changes to be brought about must have an impact on the practices of text production and

comprehension, on the social uses of written language and on education.

As Emilia Ferreiro (2001) rightly points out, being literate is not equivalent to “knowing the alphabet,” reading is not the same as decoding, and cognitive difficulties in understanding the particular way of representing language (writing) have nothing to do with difficulties in accessing this or that writing technology. To circulate among different types of texts is the fundamental requirement of modern times; there are no privileged texts but simultaneous exposure to diversity (as happens with the acquisition of oral language). Being a critical reader and having criteria to be able to select are educational objectives that must be addressed throughout primary and high school, both with respect to a printed and a digital format.

Students use reading to analyze and acquire information presented in online texts, books, and other print materials (Berman, 2009), while writing is used primarily to enhance and promote students’ learning and to assess what they know (Bangert-Drowns *et al.*, 2004; Graham, 2006). To ensure that students derive maximum benefit from reading and writing relationships, it is necessary to provide them with a wide range of literacy experiences. Students need to be encouraged to read and write in print and digital formats, in a variety of situations and for a variety of reasons (Shanahan, 1988).

In the workplace, for example, reading and writing are present for acquiring and sharing information, for communicating with others, for tracking and recording relevant information, and for developing reports and disseminating policy. Reading and writing also permeate everyday life, with text carriers such as market lists, short notes taped to the refrigerator, text messages, blogs, emails, and other forms of analog and digital literacies in frequent use in the contemporary world (Graham *et al.*, 2017).

The processing of reading and writing modes often occurs simultaneously (Lemke, 1998). Whether on paper or electronically, the text is a discourse represented by the graphic system of a language, preserved on a material support (paper, magnetic or optical media) and accessible through a variety of devices. What these media share, from a linguistic and communicative point of view, is their “textual unity,” i.e., a text deals with a particular subject from beginning to end, regardless of how it is presented. And the cardinal difference between print (paper texts) and digital (electronic texts) lies in the speed of transmission of the latter with respect to the former (Vaca & Hernández, 2006).

Evidently, the reading and writing of both paper and electronic texts is conditioned by the mastery of the norm and the graphic system of our language, which is why its teaching continues to be fundamental in our educational system. However, today’s school has the duty to promote the production and distribution in electronic and paper media, where the way in which meaning is constructed is also indicated. The students of today’s world need to acquire skills that allow them to make an assertive use of a diversity of media in writing, reading, when searching and selecting substantial information and when communicating (Henao *et al.*, 2006).

In this process, both general computer knowledge and skills to navigate through it must be provided, in order to

develop the competence to find, organize and use information in the most appropriate way, i.e., the development of information skills (Cordón & Jarvio, 2015). Educators must be able to teach children and young people to select, relate and organize information from a myriad of sources, since the existing information on a topic is increasingly interrelated (Henao & Ramírez, 2006). Students must thus learn to detect and discriminate quality texts from those that do not have it; the prevailing problem lies in knowing how to choose, purify and recognize the most appropriate, most valuable, quality, and accurate information from that which is superfluous or not very relevant.

As Vaca and Hernández (2006) put it, it could be said that we are facing a new era of texts, readings and writings that sometimes involves the same challenges (literacy in the traditional sense) and, at other times, demands new challenges from the reader and the writer (for example, contemporary literacies). Although with different modalities, whether in print or digital, reading and writing will continue to be interactivities between a reader and a writer that can be carried out at different levels of depth, thoroughness, and rigor (depending on their objectives and the social and cognitive contexts in which reading and writing take place).

Multiple literacies or multiliteracies thus constitute a pedagogical alternative that simultaneously explains linguistic diversity and the use of multimodalities in communication. Multiple modes (image, sound, gesture, movement, and text, for example) are processed during communication through varied aspects of literacy, that which is required by a society such as ours, increasingly global and interconnected (Rowell & Walsh, 2015). The most important thing in any communicative situation is to know if today’s learners are really developing new intellectual functions, skills, and abilities, and if they are able to develop the ability to read and write cognitive, multiple intelligences, emotional spaces and capacities to render the complex present intelligible, in contrast to the students of the past (Cordón & Jarvio, 2015).

Undoubtedly, the processing of messages and texts affects the way students learn, and the processes involved in activities such as texting, blogging, or communicating online are developing to a greater or lesser extent cognitive activities compared to those required to read and write traditional printed texts (Rowell & Walsh, 2015; Carr, 2011). However, printed text, pencil and paper ensure the interrelation between reading and writing; as do digital communication technologies, along with the tactile facilities of some devices. In this sense, to the extent that the similarities between reading and writing on screen compared to printed texts are considered, it will be possible to see reading and writing coexisting in harmony.

Using a variety of activities in the classroom can help students refine their reading and writing skills while developing a clearer conception of how literacy can be used. Different functions involve different thinking skills and increase the likelihood that connections between reading and writing will be made. If teachers want to increase the potential benefits that reading-writing relationships bring, it is necessary to expose students to a wide constellation of

literacy uses (Shanahan, 1988).

In today's world, becoming a literate subject means mastering multiple discourses, both in print and digital media. The mastery of the tool (whether analog or electronic) is not a result, but how the tool is used. Consequently, the school must bet on an expansion of the definitions of the logic of print, reading and writing, which go hand in hand with the logic of the screen: design, redesign, and mix. Thus, the approach to the literacy of digital and print texts has to combine school knowledge that is based on the analog with new forms of multimodal composition to create compelling new texts that reflect the identities and socially situated discourses of the authors (Rowse & Walsh, 2015).

IV. TOWARDS THE DEVELOPMENT OF READING COMPREHENSION SKILLS

Education is the vehicle that transmits culture and if the new generations are not able to read with understanding, to think about what they read and analyze it, as well as to write clearly and effectively about what they have learned and what they think, it is certain that they will not be able to do justice to their talents and potential, nor will they be able to face today's society or generate the changes it requires. Now, if students find it difficult to acquire operative knowledge, it is because they do not understand what they read, nor do they know how to situate themselves critically in relation to their context, and that is where reading comprehension, especially in the contemporary world, plays a transcendental role.

Reading comprehension is defined as an intentional process, in which the reader plays an active and central role, bringing into play a range of cognitive skills that allow him/her to organize and interpret the data presented in the text, mainly based on the knowledge he/she has of the subject (Parodi, 1998). As a conscious act in which countless processes of inner apprehension of the senses of things culminate, reading comprehension becomes the scenario where the person reading elaborates meaning in his interaction with the text and the context, and participates actively as he has in his mind certain mental schemes referring to what he is reading and relates them to what he knows or what he can compare, project and relate, valuing his motivation for reading and the results achieved (Flores-Carrasco *et al.*, 2017).

Reading comprehension, regardless of the text support (whether printed or digital), is a skill of high cognitive demand, where the student, in general, obtains low results due, in part, to the mechanism of school teaching, which, methodologically, does not guide to good comprehension strategies or representation of information, and emphasizes on memory and literal repetition, leaving aside the development of local inferences and global ideas of the text (Peronard, 2007), added to the scarce motivation generated by writing and reading, since few school activities contribute to the motivation for writing and reading in both electronic and analogical formats.

Today, understanding involves the mastery of several competencies, among them, knowing how to read and write critically, in several languages, and in different formats and

supports (Pérez, 2012). Consequently, it can be stated that reading and writing have become more complex with the presence of electronic texts that demand skills and abilities beyond those necessary for the comprehension of printed reading, which is otherwise conventional and linear (Coiro, 2011).

Reading comprehension is directly related to text reading learning strategies; thus, a good reader applies strategies before reading (planning and activation), during reading (monitoring and control strategy) and after reading (reaction and reflection) (Solano *et al.*, 2004). The support does not seem to have an impact on reading comprehension, since reading comprehension depends on the particular reading skills of the individual; a competent reader will perform similarly in both print and digital support (Flores-Carrasco *et al.*, 2017). In electronic text, the same comprehension factors are taken into account as in traditional reading: text coherence, prior knowledge, discursive schemes and cognitive skills of the reader (Morales & Espinoza, 2003).

Writing about a read text significantly improves comprehension of the text. Teaching writing increases students' reading level, reading fluency, and reading comprehension skills; therefore, increasing the frequency with which students write has to improve their abilities to comprehend text (Graham *et al.*, 2017). Reading and writing are activities in which meaning is generated. When we read, we have a purpose, such as enjoying a literary text or learning from an informative text; and when we write something similar happens, as we are also accompanied by a purpose, whether it is to recreate ourselves, to convey a message, or to simply give an account of something.

The development of reading comprehension skills is essential to enter the working world and participate actively and responsibly in the knowledge society (Rowse & Walsh, 2015). That is why at school students should be allowed to start from different levels of knowledge, or from different purposes, and experience heterogeneous levels of comprehension, where their participation in the construction of the meaning of the text tends, for example, to be more active and dynamic. Reading competence, beyond the ability to identify the letters of the alphabet or recognize written words, is the ability to integrate linguistic knowledge, cognitive background and even the affective world of the student in the process of exploring and constructing the meaning of a written text (Henao and Ramírez, 2006).

Although some research indicates that reading texts on a computer screen leads to significantly lower levels of reading comprehension than those resulting from reading printed text (Carr, 2011; Coiro, 2011), similar research indicates that even if the media are different, the cognitive processing is the same, making the skills transfer from one medium to another (Ferreiro, 2011; Mangen *et al.*, 2013).

To improve reading comprehension levels, some of the actions involved in writing must be automated: preparation (planning), writing (textualization), revision (proofreading) and editing (publishing). As well as the actions involved in reading: planning (definition of goals and establishment of strategies to achieve them), regulation (change of cognitive procedures when a failure in comprehension is observed), and control and evaluation (monitoring during reading and its subsequent evaluation); since most of them are not

developed spontaneously (Núñez *et al.*, 2006; Peronard, 1997).

What is important is that students learn knowledge or understand the information they read in printed and digital texts through continuous reading and writing practices of printed and digital content, that is, both with electronic and on-screen supports as well as with analog and paper supports. The fundamental thing is to ensure that reading and writing in schools cease to be only a tool for control and evaluation, and become tools for communication, expression, and participation, both for students and teachers; this could be achieved through the creation of pedagogical strategies that are evident in a transversal manner in the curricular and classroom plans that teachers build.

According to Nell K. Duke *et al.* (2011), there are 10 essential elements for efficient teaching of reading comprehension that, research in the field suggests, every teacher should be committed to if his or her goal is to foster and teach it in a meaningful way. And these elements are: (1) To build disciplinary and world knowledge; (2) To provide contact with a large number and variety of texts; (3) Provide motivating texts and contexts for reading; (4) Teach strategies for comprehension; (5) Teach text structures; (6) Engage students in discussion; (7) Develop vocabulary and language knowledge; (8) Integrate reading and writing; (9) Observe and assess; and (10) Differentiate instruction.

In this regard, innovative approaches to lifelong learning and education focused on reading comprehension are needed. Rapid progress in this area is imperative if the goal is to prepare readers who are versatile enough to understand the historical moment that befalls them as citizens of an ever-changing world, based on the text at their disposal (Duke *et al.*, 2011). The educator, therefore, must work to understand what cultural materials are relevant for intellectual development and, at the same time, needs to understand what trends the culture is following in order to know how to direct his or her work (Papert, 1981).

The process of reading and reading comprehension relies on long-term memory and short-term memory. Long-term memory is the memory where all the reading experience that a person has accumulated in his or her life is recorded; knowledge schemes organize the information in a structured manner, which also contains the mastery of the language system that has been achieved (whether lexical or grammatical), and the knowledge of the topic to be read about. All this, by constituting prior information, allows the reader to anticipate or formulate hypotheses about the text, even before starting to read it (Cassany *et al.*, 1994).

It should be noted that the process of formulating and verifying hypotheses, according to Daniel Cassany *et al.* (1994), is the essence of comprehension, since it is the interaction between what the reader already knows and the new information extracted from the text; where the formulation of hypotheses also includes several micro-skills: prediction, anticipation, and inference. Likewise, before starting to read, the reader sets reading objectives related to the communicative situation and which determine how to read, and when reading, the reader tends to use skimming and scanning skills to choose what interests him/her from the text.

Short-term memory, meanwhile, is that which allows one

to remember something for a short time and thus process the information as one reads: it is an interactive reading complex that ends only when the reader has formed a mental representation of the text, according to the goals he or she has set for him or herself. To be successful, today's students need to acquire effective literacy skills and be able to use these skills as tools for continuous learning. Writing practices in print and digital formats should then be promoted to help students increase their reading and reading comprehension skills (Graham & Hebert, 2010).

The contemporary world requires a citizenry with maturity and awareness that takes sides in the political decisions that concern them and that is committed to the critical understanding and positive transformation of their context. And although in a democratic system or one that pretends to be democratic, freedom of thought and expression is something that is considered respectable, the new generations must be trained to understand the point of view and interests of the other, starting from the text itself, and thus know how to discriminate the reliable from the misleading in order to take a conscious and social, but not unfounded, position on the matter.

V. CONCLUSION

We are facing a new era of texts, readings and writings that pose new challenges, literacy in its broadest sense; and demand new challenges from the reader and the writer, computer literacy on a par with analog literacy, for example. Although with different supports and modalities, reading and writing will continue to be interactions between a reader and a writer that can be carried out at different levels of depth, thoroughness, and rigor; according to the objectives and social and cognitive contexts in which the acts of reading and writing take place.

The digital aspect of text and its multimodal tendency, as well as print and its new waves, in no way replace the traditional challenges of education, which are based on literacy, but rather multiply in a different way the challenges of education even exorbitant in their complexity. Just as the practices of reading and writing on paper are diverse, so are the practices of reading and writing electronic texts on the screen; sometimes they coincide with each other, but sometimes they do not.

The appearance of electronic text does not represent the disappearance of physical text or of reading or writing; it represents, instead, coexistence, since in today's society, knowledge and mastery of both digital and printed texts are essential for a successful professional life. Although much remains to be explored about the effective social practices of production and reading of texts, the processes of production of texts on paper and electronic support, as well as their reading, give eloquent evidence of the feasible harmonious coexistence between the printed and the digital.

As a unit of meaning, the text is the same regardless of whether it is on paper or on screen. The text exists to the extent that the writer and the reader endow it with life and meaning, respectively. In this sense, it is imperative to strengthen and maintain the coexistence and balance between print and electronic.

In the current educational scenario, the use of one text format or another depends both on the possibilities offered by it and on the objective to be achieved. Therefore, it is advisable to enable the student to face and interact with both text dimensions, so that he/she can get to know them and decide, at his/her own discretion, the advantages, and disadvantages that each of them offers. Consequently, this makes it possible that, when the time comes, the student will be able to choose the text format (digital or printed) that best suits his tastes and interests.

In this time in which the digital format shares protagonist with the printed format in the educational field, it is necessary to think differently and accommodate to the new circumstances with other allegories and more contemporary epistemological tools, since new supports for reading and writing appear, but also new readers and writers with readings and writings in a process of constant and continuous transformation. And the teaching, the cornerstone of any educational system, profiled through various media, helps to increase learning.

Reading efficiently and productively through the application of different elements and techniques such as the elaboration of summaries and the, and stimulates the sentences and unknown words, provides underlining of main phrases of the text, provides understanding comprehension ability to have a broad vision of knowledge.

A good writer in today's society, on the other hand, must be able to make his ideas flow with paper and pencil, as well as with a word processor and a keyboard, since what matters is not the instrument used to write, but the ideas and the coherence of the text. Therefore, it is essential to provide the student with the experience of writing in different formats (electronic and analog), especially alternately or in parallel, so that he/she can discover the advantages of each of them, compare them and establish his/her own writing method.

The school, together with the teacher, must motivate and accompany the new generations in the deep understanding of different types of texts in both media (printed and digital), changing the approaches and teaching strategies from preschool and throughout primary and high school. The development of reading and writing skills at all school levels, and the processes involved in both, must be constantly monitored so that they are studied and strengthened as basic and indispensable tools for the appropriation of knowledge and its application in the real world.

Teachers, regardless of the subject they teach, are responsible for guiding and training students in the reading and writing processes, taking into account that they are practices that enhance the student's integral development and at the same time are tools that allow them to approach the disciplinary knowledge of their own work and the production of knowledge. However, the development of reading and writing processes is not only the responsibility of the teacher or the school, but also of all the people, policies and institutions involved in one way or another in the teaching and learning processes and in school education.

Reading and writing processes, among many others, enable cognitive development. Representing, organizing, constructing, categorizing, finding relationships and analyzing any situation are skills that, when developed

through the joint work of reading and writing in printed and digital media, lead to making the right decisions, to enhance the ability to assume a critical position towards texts and life, and to allow a retrospective and even introspective look at the meanings that circulate everywhere. Therefore, it is necessary to take action and pedagogical awareness in order to favor the transcendence of such processes, to help improve the levels of reading comprehension in the school population and thus contribute to the quality of education.

REFERENCES

- Bangert-Drowns, R.L. *et al.* (2004). The effects of school-based writing-to-learn interventions on academic achievement: A meta-analysis. *Review of Educational Research*, 74(1), 29–58. <https://doi.org/10.3102/00346543074001029>.
- Berman, I. (2009). *Supporting adolescent literacy achievement* [Issue brief]. Washington, DC: NGA Center for Best Practices. Retrieved from <https://www.nga.org/files/live/sites/NGA/files/pdf/0902ADOLESCENTLITERACY.PDF>.
- Carr, N. (2011). *What is the internet doing to our minds? Superficial*. Editorial Taurus, Bogotá-Colombia. p. 341.
- Casati, R. (2015). In *praise of paper: against digital colonialism*. Editorial Ariel, Barcelona-Spain. p. 224.
- Cassany, D. (2004). Exploring current needs for understanding. Approaches to critical comprehension. *Journal: Lectura y Vida*. XXV (2), 6–23.
- Cassany, D. (1997). *Describing writing. How to learn to write*. Barcelona: Paidós.
- Cassany, D. *et al.* (1994) [reprinted 2008]. Teaching language. The four skills: Reading comprehension. Barcelona: Graó, § 6.4. *Reading comprehension*. Pp. 193–207.
- Coiro, J. (2011). Predicting reading comprehension on the internet: Contributions of offline reading skills, online reading skills, and prior knowledge. *Journal of Literacy Research*, 43(4) 352–392. doi: 10.1177/1086296X11421979. doi: 10.1177/1086296X11421979.
- Cordón, J.A. and Jarvio, A.O. (2015). Is reading and writing being transformed in the digital age? *Interamerican Journal of Library Science*, 38(2), 137–145. doi: 10.17533/udea.rib.v38n2a05.
- Di Stefano, M. and Pereira, C. (1997). Social representations in the reading process. *Signo y Señal - Revista del Instituto de Lingüística*, nº 8. Buenos Aires: Facultad de Filosofía y Letras, Universidad de Buenos Aires.
- Duke, N.K. *et al.* (2011). Essential elements of fostering and teaching reading comprehension. In: S.J. Samuels & A.E. Farstrup (Eds.). *What research has to say about reading instruction* (4th ed., pp. 51–93). Newark, DE: International Reading Association.
- Eco, U. (1981). The model reader. In: *Lector in fábula*, pp.73–95. Spain: Ediciones Lumen.
- Espinoza, N. and Morales, O. (2002). Electronic text: The disappearance of print or the emergence of a new source of reading? In: *Lectura y Vida*, 23 (4).
- Espinoza, N. and Morales, O. (2000). The development of reading and writing in the university: an experience of teacher integration. In: *FOULA*, 1 (1), 74–81.
- Ferreiro, E. (2011). Digital literacy: What are we talking about? *Educação e Pesquisa*, 37(2), 423–438. doi:10.1590/S1517-97022011000200014.
- Ferreiro, E. (2001). *Past and present tense of the verbs read and write*. FCE: Mexico.
- Flores-Carrasco, P.G. *et al.* (2017). Comprehension of texts in digital and printed support and self-regulation of learning in university groups of education students. In: *Revista Electrónica Educare*, vol. 21, núm. National University. CIDE. DOI: 10.15359/ree.21-1.7.
- García, M. (2012). Academic self-regulation as an explanatory variable of university learning processes. *Journal of Curriculum and Teacher Education*, 16(1), 203–221. Retrieved from <http://www.ugr.es/~recfpro/rev161ART12.pdf>.
- Godard, L. (2002). Literacy and informatics with seven-year-old students; realization of a classroom project. *Memorias del VII congreso latinoamericano para el desarrollo de la Lectura y la Escritura*. Puebla: Secretaría de Educación Pública.
- Goodman, K. (1980a). Behind the eyes: What happens in reading. In: H. Singer, and R. B. Ruddel (Eds.), *Theoretical models and processes of reading* (3rd ed., pp.470–495). Newark, DE: International Reading Association. (Reprinted from K. Goodman, and O. Niles (Eds.) (1970). Reading process and program).

- Goodman, K. (1980b). Reading a psycholinguistic guessing game. In: H. Singer & R. B. Ruddel (Eds.), *Theoretical models and processes of reading* (3rd ed., pp.497–508). Newark, De: International Reading Association (reprinted from the Journal of the Reading Specialist, May 1967).
- Graham, S. et. al. (2017). Effectiveness of Literacy Programs Balancing Reading and Writing Instruction: A Meta-Analysis. In: *Reading Research Quarterly*, 53(3). 279–304. doi:10.1002/rq.194. International Literacy Association.
- Graham, S. & Hebert, M. (2010). *Writing to read: Evidence for how writing can improve reading*. New York: Carnegie Corporation of New York.
- Graham, S. (2006). Writing. In: P. Alexander & P. Winne (Eds.), *Handbook of educational psychology* (pp. 457–478). Mahwah, NJ: Erlbaum.
- Henao, O. and Ramírez, D. (2006). Information and communication technologies in reading and writing. Taken from: *Propuesta didáctica para el área de lecto-escritura con un enfoque socioconstructivista y apoyada en tecnologías de información y comunicación*. Didactics and New Technologies Group. University of Antioquia.
- Henao, O. et. al. (2006). Written production mediated by computer tools. Textual quality, learning level and motivation. *Lectura y Vida (Latin American Journal of Reading)*, 27 (2), 6–13.
- Kilian, K. (2001). *Writing for the web*. Spain: Ediciones Deusto, S. A. First edition. (Original work. *Writing for the Web* published in 1998).
- Lemke, J. (1998). Metamedia literacy: Transforming meanings and media. In: *Reinking, D. Shanahan, T. (1988). The reading-writing relationship: Seven instructional principles*. The Reading Teacher, 41(7), 636–647.
- Mangen, A. et. al. (2013). Reading linear texts on paper versus computer screen: Effects on reading comprehension. *International Journal of Educational Research*, 58, 61–68. doi: 10.1016/j.ijer.2012.12.002.
- Morales, O. and Espinoza, N. (2003). Reading and writing: coexistence between print and electronic. *Educere*, 7(22), 213–222. Universidad de los Andes, Mérida – Venezuela.
- Morales, O. y Espinoza, N. (2002). The development of writing in university students. Paper presented at VII Congreso Latinoamericano para el Desarrollo de la Lectura y la Escritura. Puebla: Secretaría de Educación Pública.
- Murray, D. (1980). How writing finds its own meaning. In: T. Donovan, and B. McClelland (Eds.), *Teaching composition: Theory into practice*. Urbana, IL: National Council of Teachers of English.
- Núñez, J.C. et. al. (2006). Self-regulated learning as a means and goal of education. *Papeles del Psicólogo*, 27(3), 139–146. Retrieved from <http://www.redalyc.org/pdf/778/77827303.pdf>.
- Papert, S. (1981). *Challenging the mind: Computers and education*. Buenos Aires, Argentina: Ediciones Galápagos. 255 p.
- Parodi, G. (1998). Strategic ability and the comprehension of written texts. In: M. Peronard, L.A. Gómez, G. Parodi and P. Núñez (Eds.), *Comprensión de textos escritos: From theory to the classroom*; pp. 175–189. Chile: Andrés Bello.
- Pérez, P. (2012). Reading on screen. *Revista Aula Infantil*, 67, 22–23.
- Peronard, M. (2007). Reading on paper and computer screen. *Signos Journal*, 40(63), 179–195. doi: 10.4067/S0718-09342007000100009.
- Peronard, M. (1997). Comprehension of written texts as a strategic process. In: M. Peronard, L.A. Gómez, G. Parodi and P. Núñez (Eds.), *Comprensión de textos escritos: From theory to the classroom* (pp. 163–173). Santiago: Andrés Bello.
- Rosenblatt, L. (1985). Writing and reading: the transactional theory. *Technical Report No. 416*. New York: New York University.
- Rowell, J. and Walsh, M. (2015). Rethinking literacy for new times: multimodality, multiliteracies, and new literacies. *Enunciation*, 20(1), 141–150.
- Shanahan, T. (2016). Relationships between reading and writing development. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (2nd ed., pp. 194–207). New York, NY: Guilford.
- Shanahan, T. (1988). The reading-writing relationship: Seven instructional principles. *The Reading Teacher*, 41(7), 636–647.
- Smith, F. (1997). *Between hope and havoc*. Portsmouth, NH: Heinemann.
- Smith, F. (1981a). *Writing and the writer*. New York: Holt, Rinehart, and Winston.
- Smith, F. (1981b). Myths of writing. In: *Language Arts*, 58(7), 792–798.
- Solano, P. et. al. (2004). Self-regulation of learning from texts. *Galician-Portuguese Journal of Psicoloxia e Educación*, 11(9), 111–128. Retrieved From http://webdocente.altascapacidades.es/Aprendizaje%20Autorregulado/RGP_11-8.pdf.
- Teberosky, A. and Tolchinsky, L. (1995). *Beyond literacy*. Buenos Aires, Argentina: Santillana, Aula XXI.
- Tierney, R.J. & Pearson, P.D. (1983). Toward a composing model of reading. *Language Arts*, 60(5), 568–580.
- Vaca, J. and Hernández, D. (2006). Paper texts vs. electronic texts: new readings? In: *Perfiles Educativos*; XXVIII (113), 106–128.